We Claim:-

1. A method of determining the number of magnetic particles within a sample using a tuned circuit having a capacitor and a coil, the method comprising:

a. determining the difference in the resonant frequency of the tuned circuit when the sample is exposed to a magnetic field generated by the coil and when the sample is not exposed to the magnetic field generated by the coil; and

b. using the difference in the resonant frequency to determine the number of magnetic particles within the sample.

2. A method according to claim 1, wherein step (a) comprises:

i. exposing the sample to the magnetic field generated by the coil;

ii. determining the resonant frequency of the tuned circuit;

iii. removing the sample from the magnetic field generated by the coil; and,

iv. determining the resonant frequency of the tuned circuit.

3. A method according to claim 2, wherein the step of determining the resonant frequency comprises:

a. applying a driver signal to the tuned circuit;

b. measuring the phase difference between the driver signal and an output signal obtained from the tuned circuit; and,

c. adjusting the frequency of the applied signal until there is no phase difference between the applied signal and the output signal.

4. A method according to claim 3, wherein the driver signal has a frequency of above 200kHz.

5. A method according to claim 1, wherein the magnetic particles comprise PMPs.

6. A method according to claim 1, wherein the coil is one of a solenoid, a ring coil and a flat coil.

7. A method according to claim 6, wherein when the coil is a solenoidal coil, the method of exposing the sample to the magnetic field comprises placing the sample within the solenoidal coil.

8. A method according to claim 6, wherein when the coil is a flat coil, the method comprises placing the sample adjacent the coil.

9. A method of performing a binding assay, the method comprising:

a. immobilising layer of molecules to a substrate;

b. providing a number of magnetic particles as labels;

c. performing a reaction using the molecular layer so as to bind at least some of the magnetic particles to the substrate; and,

d. determining the number of magnetic particles bound to the substrate by determining the difference in the resonant frequency of a tuned circuit when the substrate is exposed to a magnetic field generated by a coil and when the substrate is not exposed to the magnetic field generated by the coil.

10. A method according to claim 9, wherein the magnetic particles are bound to a respective number of second molecules and wherein the reaction binds second molecules with the molecular layer so as to bind the magnetic particles to the substrate.

11. A method according to claim 10, wherein the binding assay is an immunoassay, the molecular layer being an antibody/antigen layer and the second molecules being antigens or antibodies.

12. A method according to claim 9, wherein the substrate comprises a plastic strip.

13. A method according to claim 9, wherein the coil is one of a solenoid, a ring coil and a flat coil.

14. A method according to claim 9, wherein the method of determining the number of magnetic particles comprises:

a. determining the difference in the resonant frequency of the tuned circuit when the sample is exposed to a magnetic field generated by the coil and when the sample is not exposed to the magnetic field generated by the coil; and

b. using the difference in the resonant frequency to determine the number of magnetic particles within the sample.

15. Apparatus for determining the number of magnetic particles within a sample, the apparatus comprising:

a. a tuned circuit having a capacitor and a coil;

b. a driver which generates a driving signal for driving the tuned circuit; and,

c. a detector for detecting the resonant frequency of the tuned circuit;

wherein the difference in the resonant frequency of the tuned circuit when the sample is exposed to a magnetic field generated by the coil and when the sample is not exposed to the magnetic field generated by the coil represents the number of magnetic particles within the sample.

16. Apparatus according to claim 15, wherein the detector comprises a phase comparator for determining the phase difference between the driver signal and an output signal obtained from the tuned circuit.

17. Apparatus according to claim 15, wherein the driver comprises a voltage controlled oscillator.

18. Apparatus according to claim 17, wherein the detector comprises a phase comparator for determining the phase difference between the driver signal and an output signal obtained from the tuned circuit, and wherein the voltage controlled oscillator is responsive to the phase comparator to alter the frequency of the driver signal until there is no phase difference.

19. Apparatus according to claim 15, wherein the apparatus forms a Phase-Locked Loop Oscillator circuit.

20. Apparatus according to claim 15, wherein the magnetic particles are PMPs.

21. Apparatus according to claim 15, wherein the coil is one of a solenoid, a ring coil and a flat coil.

22. Apparatus according to claim 21, wherein when the coil is a flat coil formed on a substantially planar surface, the sample is positioned adjacent the coil to expose the sample to the magnetic field.

23. Apparatus according to claim 21, wherein when the coil is a solenoidal coil, the sample is positioned within the solenoidal coil to expose the sample to the magnetic field.

24. Apparatus according to claim 23, wherein the solenoidal coil has an oval cross section.

25. Apparatus according to claim 21, wherein when the coil is a ring coil, the sample is positioned within a gap in the ring to expose the sample to the magnetic field.

26. Apparatus according to claim 15, wherein the driver signal has a frequency of above 200kHz.